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SOLAR ENERGY IN CALIFORNIA: A CASE FOR THE SUN

Solar energy is democratic. It falls on everyone, and can be put to use by individuals and small groups of people. The public enthusiasm for solar is perhaps as much a reflection of this unusual accessibility as it is a vote for the environment, kindliness and inherent renewability of energy from the sun.[1]

INTRODUCTION

Escalating prices of conventional energy sources,[2] growing scarcity of fossil fuels, and uncertainty about the future of nuclear power dictate the development of renewable alternative sources to supply an increasing demand for energy.[3] Concern about the quality of the environment dictates that any such source be nonpolluting.[4] The California legislature has declared that solar energy is just such a source.[5] It is a limitless, nonpolluting energy source which can reduce the state's dependence on nonrenewable fossil fuels, supplement existing energy sources, and decrease the

1. Shaner, *Solar Energy: Dawning of a New Age*, NATIONAL PETROLEUM NEWS, January, 1978, at 64 (citing SCIENCE NEWSLETTER).

2. *See, e.g., P.G.&E. Requests Massive Rate Increase*, San Diego Evening Tribune, Nov. 1, 1979, at A-5, col. 1. Pacific Gas and Electric Company asked the California Public Utilities Commission to approve a $910 million rate increase that could "nearly double" the heating bill for some consumers and raise the average household utility bill by approximately 22%. A 60% increase in the price of OPEC oil and a similar price boost in Canadian natural gas prompted the request.

3. Lovins, *Energy Strategy: The Road Not Taken?* 55 FOREIGN AFF. 65 (1976). *See also* JOINT INVESTIGATION BY THE PUBLIC UTILITIES COMMISSION AND THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION INTO THE AVAILABILITY AND POTENTIAL USE OF SOLAR ENERGY IN CALIFORNIA. CPUC Case No. 10150, Decision No. 89592 (October 31, 1978), ERCDC No. 76-R&D-1 (April 14, 1978) [hereinafter cited as JOINT INVESTIGATION]; B. COMMONER, THE POLITICS OF ENERGY (1979); Dorfman, *For Exxon's Eyes Only: Internal Study Indicates Nuclear Power May Be an Economic Bust*, ESQUIRE, June 10, 1979, at 16.

4. *See* B. COMMONER, *supra* note 3, at 51-52. *See also* Friends of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 254-55, 502 P.2d 1049, 1053, 104 Cal. Rptr. 761, 765 (1972); CAL. PUB. RES. CODE §§ 21000-21003 (West 1977 & Supp. 1979); JOINT INVESTIGATION, *supra* note 3, at 4.

5. Solar Rights Act of 1978, ch. 1154, § 2, 1978 Cal. Stats.

air and water pollution that result from the use of conventional energy sources.[6]

Solar energy is becoming an economically competitive and technically feasible source of residential heating.[7] It can contribute to the maintenance of a high quality environment, a goal that was established for the people of California with the adoption of the California Environmental Quality Act (CEQA).[8] Whenever a public agency has discretionary power to approve a project that may have significant adverse environmental effects, CEQA's environmental review process is triggered.[9] An environmental impact report must be prepared setting forth detailed information about the probable environmental effects of the project and ways to avoid or decrease the adverse impacts.[10] Any measure that will substantially reduce the significant environmental effects must be identified and should be incorporated into any project under consideration.[11]

This Comment will illustrate how solar energy fits into the statutory framework of CEQA. It will focus on solar domestic water heating and to some extent space conditioning[12] as an example of how CEQA's mandate may be interpreted in light of a specific en-

6. *Id.*

7. *See* text accompanying notes 38-75 *infra.*

8. CAL. PUB. RES. CODE §§ 21000-21174 (West 1977 & Supp. 1979). The Act, originally entitled the Environmental Quality Act of 1970, was amended in 1972 to reflect the new name. Sections 21000 and 21001 set out the broad environmental policies, which include the state's policy to "[d]evelop and maintain a high-quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state."

9. CEQA is expressly limited to discretionary projects. CAL. PUB. RES. CODE § 21080 (West Supp. 1979); CAL. ADMIN. CODE tit. 14, §§ 15060, 15073 (1978). When a project is a hybrid discretionary/ministerial project, any doubt will be resolved in favor of environmental protection, and the project will be deemed discretionary. People v. Department of Housing and Community Dev., 45 Cal. App. 3d 185, 194, 119 Cal. Rptr. 266, 272 (1975); CAL. ADMIN. CODE tit. 14, § 15073(d) (1978). For a discussion of what constitutes a project under CEQA, see note 14 *infra.*

10. CAL. ADMIN. CODE tit. 14, § 15084 (1978). For a thorough discussion of the functions of EIRs, see Hildreth, *Environmental Impact Reports Under the California Environmental Quality Act: The New Legal Framework*, 17 SANTA CLARA L. REV. 805 (1977).

11. CAL. PUB. RES. CODE §§ 21002, 21081 (West 1977); CAL. ADMIN. CODE tit. 14, § 15143(c) (1978).

12. This general term is usually used to stand for both active and passive space heating and cooling. However, for purposes of this article, the term "solar heating" will be used to denote solar domestic water heating and passive space conditioning design, unless otherwise specified.

> Passive solar energy applications involve careful architectural design to maximize solar heat gains in winter, and provide methods to reduce solar gains and increase natural cooling methods in summer. Energy flows within the structure utilize natural convective and other forces, and do not rely on any outside source of energy; hence the term "passive." Passive solar applications are closely akin to good energy conservation designs, but include in addition special provisions to increase the solar gain, to ab-

vironmentally beneficial technology.[13] A residential development will be used as an example of a project under consideration for approval.[14] The Comment will first demonstrate that solar heating qualifies as a feasible mitigation measure within the meaning of CEQA and that as a result it should be incorporated into projects under normal circumstances. The Comment will then address itself to administrative and judicial methods to obtain and enforce proper consideration of solar heating through CEQA's environmental review process.

SOLAR HEATING AS A FEASIBLE MITIGATION MEASURE UNDER CEQA

One of CEQA's important environmental protection devices is the requirement that feasible measures be employed to reduce

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sorb and retain the collected solar heat in a storage mass, and methods to control the energy flow.

Active solar energy systems are distinguished from passive systems by the fact that they use external sources of energy to move energy, and generally by the use of special system components to collect, store, and transport the collected energy. Rather than use building elements for these purposes, active systems usually involve special collectors to receive solar energy and convert it to thermal energy, and storage tanks or rock boxes which can retain the collected thermal energy until it is needed.

DOMESTIC POLICY REVIEW OF SOLAR ENERGY INTEGRATION GROUP, STATUS REPORT ON SOLAR ENERGY, at III 1-2 (August 25, 1978).

13. This does not mean to preclude any other forms of solar technology applications from the ambit of CEQA; indeed, it is hoped that this will be an example of how other solar technologies—e.g., photovoltaic electrical generation—may be incorporated as they become feasible.

14. California Public Resources Code § 21065 defines a project as:

(a) Activities directly undertaken by any public agency.

(b) Activities undertaken by a person which are supported in whole or in part through contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.

(c) Activities involving the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies.

CAL. PUB. RES. CODE § 21065 (West 1977). For the purposes of this Comment, a proposed housing development will be used as one example of a project. The analysis herein may be applied equally to other residential and commercial development projects that fall within the ambit of CEQA's environmental review process. Furthermore, whenever the term project or housing development is used, it will be assumed that the proper preparatory steps have been completed, and the agency has made the determination that the proposed development may have a significant effect on the environment. In other words, it will be assumed that CEQA's environmental review process applies. *See* Friends of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 502 P.2d 1049, 104 Cal. Rptr. 761 (1972).

the resultant harm from a project under consideration.[15] Solar heating must first qualify as a feasible mitigation measure within the meaning of CEQA. The lead agency, which has the primary responsibility, should then not approve the project as proposed unless specific economic, social, or other conditions render the incorporation of solar heating into the project infeasible.[16] Before solar heating will be required in a residential development under CEQA, it must be shown that it is a technology that is reasonably capable of being utilized and that can substantially reduce the environmental harm caused by a housing development.[17]

Additional Demand on Conventional Energy Sources Will Have a Significant Adverse Environmental Effect

The production of energy from conventional sources—whether coal, oil, natural gas, or nuclear—results in some form of environmental degradation. The use of fossil fuels contributes significantly to both air and water pollution.[18] Nuclear fuels constitute a unique, problematic environmental hazard in their use, transportation, and disposal.[19]

Any new source of energy demand will increase the burden on already taxed existing supplies. Power plants currently producing energy may not be able to meet the growing demand in Cali-

15. CAL. PUB. RES. CODE § 21081 (West 1977). *See also* Hildreth, *supra* note 10, at 807.

16. CAL. PUB. RES. CODE § 21081 (West 1977).

17. *Id.* §§ 21068, 21085 (West 1977). *See also* text accompanying notes 28-37 *infra.*

18. *See* U.S. DEP'T OF ENERGY, DOMESTIC POLICY REVIEW OF SOLAR ENERGY: A RESPONSE MEMORANDUM TO THE PRESIDENT OF THE UNITED STATES, 26-27 (1979) [hereinafter cited as DOMESTIC POLICY REVIEW]:

> Fossil fuel combustion is currently a major cause of air pollution, contributing large quantities of sulfur oxides, nitrogen oxides, hydrocarbons, and carbon monoxide to the atmosphere. These pollutants have been shown to contribute significantly to the incidence of cardiovascular and respiratory diseases as well as the deterioration of crop and property values. Sulfuric acid drainage from coal mines and thermal discharges from electric utilities contaminate the Nation's waters, while oil spills from super tankers and blowouts from off-shore wells can pollute the oceans. Moreover, coal mining leads to the death of more than a hundred miners and to more than ten thousand mining injuries per year. The Federal Government is now paying compensation of a billion dollars a year to victims of black lung disease.

19. Nuclear power raises a host of potential environmental problems of its own. These problems arise at every state of the nuclear process, from extraction, transportation and use of fissionable materials to storage and ultimate disposal of radioactive nuclear waste. *Id.* at 27. Of all conventional energy sources, hydroelectric generation is the only environmentally clean source. This is, in essence, an indirect form of solar energy. *See* B. COMMONER, *supra* note 3, at 40. *See also* Solar Rights Act of 1978, ch. 1154, § 2, 1978 Cal. Stats; JOINT INVESTIGATION, *supra* note 3, at 4.

fornia in five years.[20] New, conventionally fueled power plants will add to the pollution currently being created by existing plants unless growth in demand decreases.[21] The cumulative demand for energy that will result from new residential development in California will be significant. Residential energy use constitutes approximately seventeen per cent of total energy consumption,[22] three-fourths of which is used for space conditioning and heating water.[23]

It follows that one of the significant adverse environmental effects that will result from a proposed residential development is the pollution derived from increased energy demand. Whenever such a development is proposed all the potentially substantial adverse changes in the environment must be described with specificity in the Environmental Impact Report (EIR).[24] A complete description of the expected significant effects is one of the EIR's main functions.[25] Furthermore, the EIR guidelines implementing CEQA, which are binding on all public agencies, list use of fuel or energy in a wasteful or inefficient manner as a significant environ-

20. Sheils, *Utilities in Trouble*, NEWSWEEK, May 7, 1979, at 81, 82-85.

21. *See generally* B. COMMONER, *supra* note 3; JOINT INVESTIGATION, *supra* note 3.

22. 3 U.S. DEP'T OF ENERGY ANN. REP. 279-332 (1978) (residential energy consumption compared to commercial, industrial, and transportation sectors).

23. D. WATSON, DESIGNING AND BUILDING A SOLAR HOUSE 9 (1977). These figures are for national energy consumption, and slight variations for California can be expected.

24. CAL. ADMIN. CODE tit. 14, § 15143(a) (1978). When an EIR is prepared, it must:

> [d]escribe the direct and indirect significant effects of the project on the environment, giving due consideration to both the short-term and long-term effects.
> It should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems and changes induced in population concentration, the human use of the land (*including commercial and residential development*) and other aspects of the resource base such as water, scenic quality and public services.

Id. (emphasis added). *See id.* §§ 15000-15192 app. G (1978), for a list of what might be considered "significant" effects in normal circumstances. For a discussion of the term "significant", see No Oil, Inc. v. City of Los Angeles, 13 Cal. 3d 68, 529 P.2d 66, 118 Cal. Rptr. 34 (1974). CEQA defines "environment" as "the physical conditions which exist in the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance." CAL. PUB. RES. CODE § 21060.5 (West 1977).

25. CAL. PUB. RES. CODE § 21002.1(a) (West Supp. 1979); *see* Hildreth, note 10 *supra*.

mental effect, which should be addressed in the EIR.[26] If the proposed development will use energy in a wasteful or inefficient manner, this fact plus measures proposed to reduce this waste must be in the EIR.[27]

Solar Heating as a Mitigation Measure

Solar heating qualifies as a mitigation measure within the meaning of CEQA. Another of the important functions of the EIR is to indicate the manner in which the significant environmental effects of the project can be mitigated or avoided.[28] The EIR must contain a discussion of measures that will reduce any wasteful energy consumption that has been outlined in the significant effects section.[29] Solar energy is among the energy conservation measures that should be considered to meet these requirements.[30]

Solar heating is a technology that will substantially reduce increasing demand upon conventional energy supplies caused by residential development.[31] The use of solar heating systems will

26. CAL. ADMIN. CODE tit. 14 §§ 15000-15192 (1978). Section 15005 states that the guidelines are binding on all public agencies.

27. People v. County of Kern, 62 Cal. App. 3d 761, 774, 133 Cal. Rptr. 389, 397 (1976).

28. CAL. PUB. RES. CODE § 21002.1(a) (West Supp. 1979); Hildreth, *supra* note 10, at 807.

29. CAL. ADMIN. CODE tit. 14, § 15143(c) (1978) reads:

> (c) Mitigation Measures Proposed to Minimize the Significant Effects: Describe significant, avoidable, adverse impacts, including inefficient and unnecessary consumption of energy, and measures to minimize these impacts. The discussion of mitigation measures shall distinguish between the measures which are proposed by project proponents to be included in the project and other measures that are not included but could reasonably be expected to reduce adverse impacts. This discussion shall include an identification of the acceptable levels to which such impacts will be reduced, and the basis upon which such levels were identified. . . . *Energy conservation measures, as well as other appropriate mitigation measures, shall be discussed when relevant* (emphasis added).

30. CAL. ADMIN. CODE tit. 14 §§ 15000-15192 app. F (1978).

31. Solar water heating systems can supply 60% to 80% of annual hot water needs for most California residences. SOLAR BUSINESS OFFICE, STATE OF CALIFORNIA, THE BENEFITS OF SOLAR WATER HEATING IN CALIFORNIA 1 (July, 1979). The city of Davis, California, has reduced energy consumption by nearly 18% per customer as a result of a conservation-oriented building code, which incorporates many passive solar design techniques. Even though the number of utility customers has increased from 11,600 to 12,500 since 1973, "total consumption of electricity by all customers declined by 6 percent." Ridgeway, *Cutting Urban Energy Use: Strategies from Four Cities*, NEW AGE, October, 1979, at 46, 51.

> Such architecture, ignored for several decades in the United States, has received increasing attention since the embargo. Energy-conscious design, where conservation and solar energy overlap, can be very effective. In Nacogdoches, Texas, for example, a retired Air Force colonel built a U-shaped passive house. In his previous home, which was nearby, he paid $850 a year for winter heating and summer air conditioning; in the new house, the annual bill fell to $260. The passive approach also works in the

allow the state to reduce its dependence upon nonrenewable energy resources and allocate those scarce resources to applications for which there are no adequate substitutes.[32] The California Energy Resources Conservation and Development Commission (California Energy Commission)[33] in 1977 determined that with an "all out" implementation program, solar energy could account for twenty percent of all residential water heating and space conditioning in California by 1985 and fifty percent by 1995.[34] Industrial and commercial solar applications, wind-generated electricity, and solar-thermal electrical production can even further reduce this demand.[35] Solar energy can provide heat and hot water without depleting nonrenewable energy sources. It is, therefore, an efficient use of energy[36] that may reasonably be expected to reduce the pollution that results from conventional energy production.[37]

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colder climates; in Maine, an 8,000-square-foot, energy-conscious commercial building saved its owner about $400 a month in heating bills.

Madique, *Solar America*, in ENERGY FUTURE 186-87 (R. Stobaugh & D. Yergin eds. 1979) [hereinafter cited as ENERGY FUTURE]. Precise figures are not yet available for savings from solar space conditioning because of the wide variety of designs and approaches. It can be expected to make a substantial contribution to energy savings. *See generally* DOMESTIC POLICY REVIEW, *supra* note 18.

32. JOINT INVESTIGATION, *supra* note 3, at 4. *See also* Solar Rights Act of 1978, ch. 1154, § 2(b), 1978 Cal. Stats. The preamble declares that "[s]olar energy systems will reduce the state's dependence on nonrenewable fossil fuels, [and] supplement existing energy sources . . . ."

33. The California Energy Commission was established pursuant to the Warren-Alquist Act, CAL. PUB. RES. CODE §§ 25000-25968 (West Supp. 1979).

34. 5 CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, CALIFORNIA ENERGY TRENDS AND CHOICES 20 (1977).

35. *Id. See* B. COMMONER, *supra* note 3. It must be remembered that all of the technology considered heretofore exists and is presently available to the consumer. The same discussion will also apply when, for example, photovoltaic electrical generation becomes available. The California legislature has directed the Energy Commission to develop and transmit to the Governor and the legislature before January 1, 1980, a plan for the maximum feasible solar implementation in California by 1990. CAL. PUB. RES. CODE § 25309.5 (West Supp. 1979). The Commission is also required to develop a continuing program for the use of solar energy in California, including *objectives* in various market sectors, *incentive* measures to achieve target objectives, and corrective measures to overcome technical, economic, and institutional barriers to maximum feasible implementation. *Id.*

36. CAL. PUB. RES. CODE § 21100 (West 1977).

37. In comparison to conventional fuels, solar energy is relatively clean and pollution-free. Solar energy usually will not contribute to air pollution, except during the production of solar equipment. Increasing solar use from the base to the maximum practical case will cut emissions of particulates, hydrocarbons, sulfur oxides, carbon monoxide and nitrogen oxides by 8 to 50 percent. At the same time, solar systems will not in-

Solar heating will fall within the ambit of CEQA only if it can be considered a "feasible" mitigation measure. CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors."[38] Solar heating is technically, physically, and economically feasible today.

Technical Feasibility

The California Public Utilities Commission and the California Energy Commission have both declared that solar water heating systems and passive design applications are technologically mature and ready for commercial application.[39] They have concluded that solar energy, in addition to conservation, should be designated as a preferred element of supply planning to meet California's future energy needs.[40] There is little disagreement that solar heating is technically feasible.[41]

Physical or Spatial Feasibility

Access to sunlight for new homes in most circumstances will not be a problem. The California legislature passed a comprehensive law governing solar easements in the Solar Rights Act of 1978.[42] Both public entities and private persons are precluded from making any covenants or restrictions on real property that would prohibit or restrict the use of a solar system. Any such existing restrictions are void.[43] Furthermore, the law requires to the extent feasible that any subdivision map recorded pursuant to ap-

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crease atmospheric carbon dioxide levels which could cause major changes in the global climate.

DOMESTIC POLICY REVIEW, *supra* note 18, at 27.

38. CAL. PUB. RES. CODE § 21061.1 (West 1977).
39. JOINT INVESTIGATION, *supra* note 3, at 5.
40. *Id.*
41. *See* DOMESTIC POLICY REVIEW, *supra* note 18.
42. Ch. 1154, §§ 1-12, 1978 Cal. Stats.
43. *Id.* § 3; *see* CAL. CIV. CODE § 714 (West Supp. 1979):

> Any covenant, restriction, or condition contained in any deed, contract, security instrument, or other instrument affecting the transfer or sale of, or any interest in, real property which effectively prohibits or restricts the installation or use of a solar energy system is void and unenforceable.
>
> This section shall not apply to provisions which impose reasonable restrictions on solar energy systems. However, it is the policy of the state to promote and encourage the use of solar energy systems and to remove obstacles thereto. Accordingly, reasonable restrictions on a solar energy system are those restrictions which do not . . . significantly decrease its efficiency, or which allow for an alternative system of comparable cost and efficiency.

plicable law provide for solar access.[44] This provision also empowers local governmental entities to require, as a condition for approval of a tentative subdivision map, the dedication of easements for solar collection.[45] Finally, the legislature has recently passed the Solar Shade Control Act, which provides that any vegetation placed on neighboring property subsequent to the installation of any solar system, which infringes on the system's access to sunlight, is a public nuisance.[46] Thus, the legal impediments to solar access are being removed.

Economic Feasibility of Solar Heating

Solar heating is economically feasible under CEQA if it is "capable of being accomplished . . . taking into account economic . . . factors."[47] CEQA gives administrators little guidance on how to determine whether a given mitigation technology qualifies. An

44. CAL. GOV'T CODE §§ 66426, 66473.1 (West Supp. 1966-1979). Section 66473.1 reads in part:

> The design of a subdivision for which a tentative map is required pursuant to Section 66426 shall provide, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivision.
> Examples of passive or natural heating opportunities in subdivision design, include design of lot size and configuration to permit orientation of a structure in an east-west alignment for southern exposure.
> Examples of passive or natural cooling opportunities in subdivision design include design of lot size and configuration to permit orientation of a structure to take advantage of shade or prevailing breezes.
> In providing for future passive or natural heating or cooling opportunities in the design of a subdivision, consideration shall be given to local climate, to contour, to configuration of the parcel to be divided, and to other design and improvement requirements, and such provision shall not result in reducing allowable densities or the percentage of a lot which may be occupied by a building or structure under applicable planning and zoning in force at the time the tentative map is filed.

45. *Id.* § 66475.3 reads in part:

> For divisions of land for which a tentative map is required pursuant to Section 66426, the legislative body of a city or county may by ordinance require, as a condition of the approval of a tentative map, the dedication of easements for the purpose of assuring that each parcel or unit in the subdivision for which approval is sought shall have the right to receive sunlight across adjacent parcels or units in the subdivision for which approval is sought for any solar energy system, provided that such ordinance contains all of the following:
>
> (1) Specifies the standards for determining the exact dimensions and locations of such easements.
>
> (2) Specifies any restrictions on vegetation, buildings and other objects which would obstruct the passage of sunlight through the easement.

46. Solar Shade Control Act § 1366, 1978 Cal. Stats. (codified at CAL. PUB. RES. CODE §§ 25980-25986 (West Supp. 1979)).

47. CAL. PUB. RES. CODE § 21061.1 (West 1977).

important economic factor will be the comparative costs of the alternative systems. This does not mean that cost is the only consideration; CEQA requires administrators to consider "economic . . . factors."[48] As a result, cost-competitiveness, although a helpful and important factor, should not alone control.

Solar heating has many economic ramifications external to the immediate purchase. It can shield the purchasers from the inflationary pressures of rising fuel costs.[49] Mortgage payments on a solar system are predictable and constant. Individual consumers will not be as dependent upon the business judgments of local utilities.[50] Decreasing dependence on foreign oil and natural gas can also aid the national economy by helping to reduce the foreign trade deficit.[51] Solar energy is also the most labor-intensive energy source; it is expected to generate a high level of domestic employment.[52]

Solar heating is economically feasible even if it is not cost-competitive with conventional heating systems. CEQA does not require that mitigation measures cost the same as or less than their more environmentally harmful counterpart. If only less expensive measures are required, no administrator would be free to require any mitigation measure that would increase the cost of a project. Neither administrators[53] nor the courts[54] have inter-

48. *Id.*

49. Once a solar system is installed, the user is less subject to unpredictable fuel price increases. With the possible exception of maintenance and replacement costs, solar systems provide cost stability for their users. This cost stability is important to consumers and businesses and is particularly beneficial to citizens on fixed incomes. The economic health of the State would be greatly improved if such a secure source of inflation-free energy were provided.

JOINT INVESTIGATION, *supra* note 3, at 4.

50. *See, e.g.,* Smith, *The Dimming of SDG&E*, READER, November 8, 1979, at 1. *See also* Sheils, *Utilities in Trouble*, NEWSWEEK, May 7, 1979, at 81.

51. This may be one of the most significant economic factors.

52. According to one congressional study, "[a] massive shift from oil and coal use to solar energy by 1990 could produce a net gain of 3 million jobs for Americans." *Job Gains Seen if U.S. Shifts to Solar Energy*, Los Angeles Times, April 22, 1979, § 1, at 1. *See also* JOINT INVESTIGATION, *supra* note 3, at 4-5:

> The widespread development of the solar industry has a tremendous potential to create jobs for Californians. This industry is relatively labor intensive (per unit of delivered energy) when compared to conventional energy delivery systems. Studies of solar job potential have been performed by the Lawrence Berkeley Laboratory, the Employment Development Department and California Public Policy Center and these studies are in general agreement on this potential. Moreover, these newly created jobs will generally not require individuals with extensive technical training. Thus, solar energy's greatest beneficial impact on the labor market will probably fall on the construction and trade workers.

53. *Cf.* Laurel Hills Homeowners Ass'n v. City of Los Angeles, 83 Cal. App. 3d 515, 147 Cal. Rptr. 842 (1978) (developer required by lead agency to reduce housing development from 124 to 94 units and to incur other expenses to mitigate adverse environmental impacts as a condition of project approval).

54. Friends of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 502 P.2d 1049,

preted CEQA to limit them to less expensive alternatives.

CEQA declares that it is the policy of the state to "[e]nsure that the long-term protection of the environment shall be the guiding criterion in public decisions."[55] The courts have indicated that economic considerations are not the most important for CEQA determinations. "The state statute [CEQA] . . . suggests that environmental protection is of paramount concern."[56] The legislative history of CEQA also supports the view that environmental values are to be assigned greater weight than the needs of economic growth.[57] External economic factors and CEQA's emphasis on environmental values support solar heating's feasibility even if it is not cost-competitive.

However, under reasonable cost projections solar heating is cost-competitive.[58] Because the solar industry is relatively new, there is little data upon which to base cost-effectiveness projections.[59] Similarly, estimates about prices and supplies of conventional energy sources vary greatly because of uncertainty of all variables involved in the analysis.[60] Since solar fuel (sunshine) is

104 Cal. Rptr. 761 (1972); Burger v. County of Mendocino, 45 Cal. App. 3d 322, 119 Cal. Rptr. 568 (1975).

55. CAL. PUB. RES. CODE § 21001(d) (West 1977).

56. San Francisco Ecology Center v. City of San Francisco, 48 Cal. App. 3d 584, 590, 122 Cal. Rptr. 100, 104 (1975). *See also* Environmental Defense Fund, Inc. v. Coastside County Water Dist., 27 Cal. App. 3d 695, 704, 104 Cal. Rptr. 197, 202 (1972), in which the court stated: "The preparation of the EIR demands thoughtful consideration of public interests transcending such necessary elements as always have been present, e.g., engineering and economic feasibility."

57. *See* CALIFORNIA ASSEMBLY SELECT COMMITTEE ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL BILL OF RIGHTS 17, 35 (1970), *cited in* San Francisco Ecology Center v. City of San Francisco, 48 Cal. App. 3d 584, 591, 122 Cal. Rptr. 100, 104 (1975).

58. The Department of Energy in a nationwide survey found that solar heating was "at or near" economic competitiveness with conventional alternatives, with regional variations in natural gas prices, heating requirements, and insulation levels. The DOE further stated that solar heating will be cost-competitive with natural gas in the future. DOMESTIC POLICY REVIEW, *supra* note 17, at 2. It is important to note that the DOE study did not take a life-cycle cost approach, which is needed for an accurate projection of the relative costs. *See* text accompanying notes 64-74 *infra*.

59. As few active solar water heaters have been in use for an extended period of time, it is impossible to predict exactly how long the system will last. Similarly, savings will vary because of climatological variations and total amount of hot water consumption. *See* text accompanying notes 64-70 *infra*.

60. Some examples of variables for conventional systems are the future availability of fossil fuels, their respective prices, as well as the general rate of inflation. *Id.*

free, the only costs involved are the initial cost of the system, a small cost for maintenance, and the cost of conventional fuel for the back-up system.[61] The installment cost of a conventional system is low, but the cost of conventional fuel is expensive and continues to rise dramatically.[62] Because the cost of a solar system in a new home will be included in the purchase price, the initial cost will be amortized over the life of the home payments.[63] It is therefore necessary when comparing costs to employ some form of life-cycle cost analysis.[64]

At this point, the difference between active and passive heating systems becomes important. Today incorporation of passive solar design will add little, if anything, to building costs.[65] Passive solar heating techniques are clearly economically feasible. Active solar heating does involve substantial equipment costs.[66] However, the amortization of the cost will to a large extent vitiate the initial difference. This extra "investment" may actually create a positive cash flow for the consumer. Depending on climatic variations and system efficiency, monthly savings in fuel bills may exceed the added monthly mortgage payments on the system.[67]

When one considers projected costs over the life of the heating

61. The cost of any easement obtained to insure solar access is considered part of the initial cost of a solar system for purposes of income tax credit. CAL. REV. & TAX. CODE § 17052.5(a)(6) (West Supp. 1979). *See* note 71 *infra*.

62. B. COMMONER, *supra* note 3. *See also* note 2 *supra*.

63. In a survey sponsored by the California Solar Business Office, of the 181 lending institutions that responded to the survey by April, 1979, 74 had made loans on new single-family homes incorporating either passive solar design features or active solar equipment, 21 had lent on new multi-family solar construction, and 16 had made solar loans for commercial properties. Twenty lenders had financed new residential subdivisions which included solar equipment or passive solar design. CALIFORNIA SOLAR BUSINESS OFFICE, SOLAR ENERGY AND CONSUMER LENDING: A SURVEY 1 (1979).

64. JOINT INVESTIGATION, *supra* note 3, at 7. The life-cycle cost of a heating system is the purchase, installation, and projected operating costs over the expected life of the system. *See also* ENERGY FUTURE, *supra* note 31, at 185, where the author states:

> Solar requires new ways of thinking about energy. Procuring energy has conventionally meant buying fuel—oil, gas and coal . . . . [S]olar energy will mean buying equipment. The fuel—sunshine—is free. This distinction makes economic comparison difficult, for frequent purchases of fuel must be measured against a one-time investment in equipment.

65. ENERGY FUTURE, *supra* note 31, at 187. *See also* Ridgeway, *Cutting Urban Energy Use: Strategies from Four Cities*, NEW AGE, October, 1979, at 46, 51.

66. The price of a solar water heating unit averages $2,000 for a new home. SOLAR BUSINESS OFFICE, STATE OF CALIFORNIA, THE BENEFITS OF SOLAR WATER HEATING IN CALIFORNIA 10 (July, 1979). A conventional gas or electric water heating system costs $200 to $300 installed.

67. Shaner, *Solar Energy: Dawning of a New Age*, NATIONAL PETROLEUM NEWS, January, 1978, at 60-65. The existence of a positive cash flow depends upon the amount of hot water used, the amount of insulation that occurs at a given location, and the efficiency of the system. Aside from utility bill savings, because solar costs are amortized, the 55% tax credit currently available to California solar con-

system, both solar domestic water heating and passive space conditioning are cost-competitive with electrical resistance heating today.[68] The life-cost of a hot water system fueled with natural gas will be less than an active solar water heating system if the price of natural gas remains the same or increases only moderately. However, the price of natural gas is expected to increase dramatically, either as prices are decontrolled or, alternatively, as shortages occur.[69]

It is apparent, therefore, from a long-term approach to economic feasibility analysis, that solar water heating and passive space conditioning are feasible.[70] Even if one applies a more traditional economic analysis, the "pay-back" approach, California's fifty-five percent tax credit can accelerate by more than one-half the amount of time needed to reimburse the purchaser of solar equipment from savings on utility bills.[71] The tax credit also helps

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sumers will increase the spendable, tax-free income of the purchaser for the years in which the credit is utilized.

> A more sophisticated analysis would consider additional factors. Assume that fuel costs rise 2 percent faster than inflation, and that the system's life is twenty years; further assume an initial 20 percent down payment and twenty additional mortgage payments. In other words, visualize a system purchased at *today's* prices—and saving energy tax-free at *tomorrow's* prices. The results—a straight 11 percent, which would amount to a 24 percent pretax return for someone in the 33 percent bracket, and a 40 percent pretax return for someone in the 50 percent bracket.
>
> . . . .
>
> One can easily argue about the precise numbers in the analysis, but the exercise should make clear that solar energy is far more "economic" than conventionally assumed.

ENERGY FUTURE, *supra* note 31, at 193.

68. JOINT ECONOMIC COMMITTEE REPORT ON THE ECONOMICS OF SOLAR HOME HEATING, 95TH CONG., 1ST SESS. 5 (March 13, 1977). This means that solar heating will be less costly, all things considered, over the life of the system.

> 69. [T]he future of solar energy will, to a great extent, be determined by the structure of the natural gas industry and by federal pricing policies which pertain to the flow of natural gas. However, because natural gas is in a state of rapid depletion, its price is expected either to rise much faster than other energy sources under decontrol, thereby relinquishing its comparative cost advantage, or with continued controls large scale curtailment will occur.

Id. The price of natural gas from Canada increased 60% on November 3, 1979. *P.G.&E. Requests Massive Rate Increase*, San Diego Evening Tribune, Nov. 1, 1979, at A-5, col. 1.

70. While *active* solar space conditioning, especially cooling, is not yet cost-competitive, it may become so as research and development of the technology bring the cost down.

71. California provides a credit of 55% of the cost of the solar system up to $3,000 against the net income tax of the purchaser when the system is for a single family dwelling. For dwellings other than single family, the credit will be $3,000 or

overcome the initial cost difference. For these reasons, the California Public Utilities Commission and the Energy Commission have declared that "[b]oth solar water heating and passive space conditioning systems are cost-effective when compared to the average costs of electricity and are competitive with natural gas costs that are based upon reasonable values for the future price of natural gas."[72] This is true even assuming that economic feasibility is equivalent to cost competitiveness. A mitigation measure arguably will be economically feasible even though it is not cost-competitive.[73] When one considers the available tax incentives, the amortized cost of the solar system, and the long-term outlook on conventional energy supplies, solar energy is today economically feasible.[74]

Therefore, solar heating is capable of being utilized now, "taking into account economic, environmental, social, and technological factors."[75] It qualifies as a feasible mitigation measure, which can substantially lessen the significant environmental effects of a project. Under section 21002 of CEQA, a public agency should not approve a project as proposed if such a measure exists, unless specific factors render incorporation infeasible. Therefore, whenever a development project is considered for approval under CEQA, the provisions that concern mitigation measures apply to solar heating.

PROPER CONSIDERATION OF SOLAR HEATING UNDER CEQA'S REQUIREMENTS

Solar heating should play an important role in any EIR prepared for a residential development. The EIR is central to the environmental review process, which is designed to carry out

25% of the cost of the system, whichever is greater. CAL. REV. & TAX. CODE § 17502.5 (West Supp. 1979). A 55% to 60% tax credit can reduce a 12-year payback period to five years. ENERGY FUTURE, *supra* note 31, at 196.

72. JOINT INVESTIGATION, *supra* note 3, at 8. The 55% tax credit is included in this consideration.

73. *See* text accompanying notes 47-58 *supra*.

74. *But see* Quinn, *Solar Energy: Mostly Cloudy*, NEWSWEEK, April 23, 1979, at 82; Stein, *Solar Hot Water Savings vs. Gas Are Questioned*, San Diego Union, March 3, 1979, § A, at 3. The added capital costs to developers and related problems are discussed in the text accompanying notes 93 and 137 *infra*.

75. CAL. PUB. RES. CODE § 21061.1 (West 1977). One negative social factor which may weigh against solar incorporation is that some may consider solar heating panels to be aesthetically displeasing. There are many social benefits to the utilization of solar energy. Once the system is purchased, the owner is not subject to inflating fuel prices, and decreased dependence upon imported oil will have a beneficial effect on the nation's economy. *See* B. COMMONER, *supra* note 3; ENERGY FUTURE, *supra* note 31; JOINT INVESTIGATION, *supra* note 3; Lovins, *Energy Strategy: The Road Not Taken?* 55 FOREIGN AFF. 65 (1976).

CEQA's intent.[76] It is the document that provides information to administrative decision makers, enabling them to balance the project's benefits against environmental costs.[77] The EIR should be prepared in order to enlighten responsible administrators about the feasibility of solar heating as a mitigation measure. The final EIR tracks the entire EIR procedure; it must include the draft (or preliminary) EIR, all comments and recommendations received thereon, and responses in the form of appropriately detailed findings.[78] The final EIR thus constitutes the record of the administrative determination. If the agency fails to properly consider solar heating prior to its approval of the project, the EIR will reflect any such failure.[79]

Solar Heating in the Draft EIR

Solar heating should be included in the draft EIR prepared by the lead agency.[80] CEQA requires that discussion of mitigation measures be emphasized and that such measures be individually identified.[81] Solar heating should be emphasized because it is a measure that will reduce the wasteful, inefficient, and unnecessary consumption of energy that would result if a new residential

76. Environmental Defense Fund, Inc. v. Coastside County Water Dist., 27 Cal. App. 3d 695, 104 Cal. Rptr. 714 (1972); CAL. PUB. RES. CODE §§ 21000-21003 (West 1977 & Supp. 1979); CAL. ADMIN. CODE tit. 14, § 15012 (1978). *See* Hildreth, *supra* note 10.

77. *See* County of Inyo v. City of Los Angeles, 71 Cal. App. 3d 185, 192, 139 Cal. Rptr. 396, 401 (1977), and authorities cited therein. This does not mean that administrators are free to ignore the significant environmental effects that are identified in the report once it is complete. On the contrary, administrators should mitigate to the extent feasible all significant effects and identify the acceptable levels to which these effects will be reduced once the project is approved. *See* CAL. PUB. RES. CODE §§ 21002, 21081 (West 1977).

78. CAL. PUB. RES. CODE § 21081 (West 1977); CAL. ADMIN. CODE tit. 14, § 15146 (1978).

79. An adequate EIR must be certified prior to agency approval of a project, No Oil, Inc. v. City of Los Angeles, 13 Cal. 3d 68, 529 P.2d 66, 118 Cal. Rptr. 34 (1974), and substantial compliance by way of informal proceedings will not be sufficient. Russian Hill Improvement Ass'n v. Board of Permit Appeals, 44 Cal. App. 3d 158, 118 Cal. Rptr. 490 (1974).

80. CEQA allows agencies to have EIRs prepared under contract for the agency and also allows project proponents to submit a preliminary EIR along with its project application. CAL. PUB. RES. CODE § 38012.1 (West 1979); CAL. ADMIN. CODE tit. 14, § 15061(b) (1978). The latter practice has been criticized because of the possibility that self-interest may motivate a project proponent to compile an EIR that is less than complete. *See* Hildreth, *supra* note 10, at 806 n.6.

81. Discussion of mitigation measures should be emphasized in the EIR. CAL. PUB. RES. CODE § 21003(c) (West 1977).

development relied completely upon conventional energy sources.[82] If the agency, after it considers solar heating, decides not to require its inclusion as a condition of project approval, it should set out detailed statements of the considerations that have rendered solar heating infeasible.[83]

Because the environmental impacts of a residential development are easily ascertainable, they should be set out in the EIR with specificity.[84] The lead agency, which is primarily responsible for drafting the EIR, should take the initiative to adequately fulfill the mandate of CEQA.[85] If for some reason the draft EIR does not discuss solar heating, responsible agencies[86] and interested members of the public may bring the solar option to the agency's attention prior to approval.

Solar Heating in the EIR Review Phase

If necessary, solar heating may first be brought to the attention of the lead agency through CEQA's comment procedure. After the draft EIR is complete, the lead agency must notify responsible agencies and the general public and provide an opportunity to comment on the adequacy of the EIR.[87] Through this procedure, any member of the public may comment upon the fact that solar

82. *Id.* § 21100; CAL. ADMIN. CODE tit. 14, § 15143(c) (1978).

83. CAL. ADMIN. CODE tit. 14, § 15089 (1978) reads:

(a) CEQA requires the decision maker to balance the benefits of a proposed project against its unavoidable environmental risks in determining whether to approve the project. Where agencies have taken action resulting in environmental damage without explaining the reasons which supported the decision, courts have invalidated the action.

(b) Where the decision of the public agency allows the occurrence of significant effects identified in the final EIR without mitigation, the agency must state in writing the reasons to support its action based on the final EIR and other information in the record. This statement may be necessary if the agency also makes a finding under Section 15088(b) or (c).

(c) If an agency makes a statement of overriding considerations, the statement should be included in the record of the project approval and should be mentioned in the Notice of Determination.

See also id. § 15088; Russian Hill Improvement Ass'n v. Board of Permit Appeals, 44 Cal. App. 3d 158, 118 Cal. Rptr. 490 (1974).

84. CAL. ADMIN. CODE tit. 14, § 15147(a) (1978).

85. Agencies should make an effort to properly comply with CEQA and not await judicial compulsion. County of Inyo v. City of Los Angeles, 71 Cal. App. 3d 185, 139 Cal. Rptr. 396 (1977).

86. " 'Responsible agency' means a public agency, other than the lead agency, which has responsibility for carrying out or approving [any aspect of] a project." CAL. PUB. RES. CODE § 21069 (West 1977).

87. CAL. ADMIN. CODE tit. 14, §§ 15085(c), (d) (1978). Organizations and individuals who have so requested shall be notified that the EIR is complete, and general notice must be given to the public and contiguous landowners. Copies of the EIRs should be made available to the general public. *Id.* "Shall" identifies a mandatory element which all public agencies are required to follow. *Id.* § 15015(a).

heating is a feasible mitigation measure that has not been adequately addressed in the draft EIR. Any comment should provide data supporting the feasibility of solar energy. Although the lead agency has the obligation to evaluate thoroughly comments received from persons who have reviewed the EIR, a comment supported by data will preclude a cursory response from the agency.[88]

Both the comment received by the agency and the response thereto must be included in the final EIR.[89] If the agency disagrees with a comment stating that additional energy demand from a project will have a significant environmental effect, the agency must clearly explain why. Similarly, if the agency receives a detailed comment stating that solar heating can substantially lessen the environmental impact, the agency must clearly respond in the final EIR. The guidelines emphasize this requirement: "In particular the major issues raised when the Lead Agency's position is at variance with recommendations and objections raised in the comments *must be addressed in detail* giving reasons why specific comments and suggestions were not accepted, and factors of overriding importance warranting an override of the suggestions."[90]

The importance of this comment procedure cannot be overstated. It may bring to the attention of the lead agency any deficiency in the draft EIR before the agency makes its final determination of approval for a project. If the agency is merely unfamiliar with the solar option, perhaps a thorough presentation will convince the agency of solar's feasibility. In this manner, costly and time-consuming review procedures can be avoided. Alternatively, if the agency rejects solar heating, there is an ample

88. *Id.* § 15083(e). If the agency receives a comment which merely states that solar energy should be required it will be able to reject the measure in a rather cursory manner. If, on the other hand, the comment contains supporting data, studies, and materials, the agency, if it approves the project without solar heating, must explain why. This is not to say that even in the first instance the agency does not have the *responsibility* to clearly explain its choice. On the contrary, the guidelines make no distinction regarding responses to detailed or undetailed comments. *See id.* § 15089, which reads in part: "Where the decision of a public agency allows the occurrence of significant effects identified in the final EIR without mitigation, the agency must state in writing the reasons to support its action based on the final EIR and other information in the record." The purpose of the detail in the comment is to make and preserve the best record possible supporting solar heating in the event of judicial review of the agency decision.

89. *Id.* § 15146(a).

90. *Id.* § 15146(b) (emphasis added).

record for judicial review.[91] If the agency does not respond properly to the comment, it will be required to do so by the courts.[92] Similarly, the comments and responses constitute evidence, on the record, that a court will consider in order to determine whether the agency's determination is supported by substantial evidence.[93]

Solar Heating as a Condition of Project Approval

Because CEQA requires the incorporation of feasible mitigation measures into proposed projects as a condition of approval,[94] solar heating should be required in a proposed housing development, unless specific economic, social, or other conditions render its incorporation "infeasible."[95] The statute does not provide a definition of "infeasible." Arguably, because infeasible is the negative of feasible,[96] it means incapable "of being performed in a reasonable period of time, taking into account economic, environmental, social and technological factors."[97] Although the legislative history supports this interpretation,[98] this would constitute a stringent standard for any determination of infeasibility. Courts are reluctant to substitute their judgment for that of the appropriate administrator.[99] It is clear, however, that any finding of infeasibility must be supported by substantial evidence in the

91. An agency determination will be set aside if the agency has not proceeded in a manner prescribed by law. No Oil, Inc. v. City of Los Angeles, 13 Cal. 3d 68, 75-77, 529 P.2d 66, 70, 118 Cal. Rptr. 34, 38 (1974); Russian Hill Improvement Ass'n v. Board of Permit Appeals, 44 Cal. App. 3d 158, 165, 118 Cal. Rptr. 490, 494 (1974); CAL. PUB. RES. CODE § 21168.5 (West 1977); CAL. CIV. PROC. CODE § 1094.5 (West Supp. 1979).

92. Russian Hill Improvement Ass'n v. Board of Permit Appeals, 44 Cal. App. 3d 158, 166, 118 Cal Rptr. 490, 495 (1974).

93. CAL. PUB. RES. CODE § 21168.5 (West 1977). *See* Laurel Hills Homeowners Ass'n v. City of Los Angeles, 83 Cal. App. 3d 515, 147 Cal. Rptr. 842 (1978).

94. *See* Hildreth, *supra* note 10, at 805-06.

95. CAL. PUB. RES. CODE §§ 21002, 21081 (West 1977).

96. *Id.* § 21061.1.

97. *Id.*

98. The legislative history of §§ 21002 and 21002.1 can reasonably be interpreted to support the argument that infeasible means incapable and therefore requires a strong showing. The final version of the bill as adopted deleted the words unreasonable and impracticable, leaving infeasible as the standard. Although infeasible is not as stringent a standard as originally proposed that "in specific situations compelling economic, social, or other conditions may require" project approval—the final compromise leaves infeasible as something more stringent than unreasonable or impracticable. Arguably, incapable fits this standard. *See* CAL. LEGIS. COMM. ON RESOURCES, LAND USE, AND ENERGY, Reg. Sess. 1975-76, Drafts AB 2679 (dated April 19, 1976, and June 10, 1976); CAL PUB. RES. CODE §§ 21002 (West 1977), 21002.1 (West Supp. 1979).

99. City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 91, 139 Cal. Rptr. 214, 219 (1977).

record.[100]

CEQA provides that there will be a prejudicial abuse of discretion if an agency's determination is not supported by substantial evidence.[101] The court will properly look to the entire record to determine whether substantial evidence supports the agency's findings and whether those findings support the agency's decision.[102] It remains to be determined what factors will satisfy the substantial evidence test when an agency determines that in a given project, solar heating is infeasible.

Where solar access cannot be obtained or guaranteed, as in the shade of a mountain or a tall building, a finding that solar heating is infeasible will clearly be supported by substantial evidence.[103] A more difficult question concerns those economic factors that will support a finding that solar incorporation is infeasible. Project proponents may claim that the added capital requirements or added cost of their product renders the incorporation of solar infeasible. Such claims will be closely scrutinized for an evidenced, factual basis. Conclusory findings of economic infeasibility will clearly be insufficient.[104]

In *Burger v. County of Mendocino*,[105] the EIR for a proposed hotel detailed many adverse effects upon the environment in the project as proposed by the developer. The county board of supervisors approved the project as proposed, despite recommendations to the contrary in the EIR. The board declared that the EIR was adequate, thorough, and complete and that they had made full consideration of the EIR. In setting aside the issuance of the building permit, the court stated:

> Moreover, there is no evidence to meet the mass of engineering and other data supporting the EIR. Counsel for the developer did state to the board

100. CAL. CIV. PROC. CODE § 1094.5 (West Supp. 1979); CAL. PUB. RES. CODE §§ 21168, 21168.5 (West 1977).

101. CAL. PUB. RES. CODE § 21168.5 (West 1977); *See* Universal Camera Corp. v. NLRB, 340 U.S. 474 (1951); Burger v. County of Mendocino, 45 Cal. App. 3d 322, 119 Cal. Rptr. 568 (1975).

102. City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 91, 139 Cal. Rptr. 214, 218 (1977).

103. The instances of physical impossibility will be rare because of the nature of residential development. The California legislature has provided for dedication of easements for solar collection as a condition to subdivision map approval to the extent feasible. CAL. GOV'T CODE § 66475.3 (West 1966 & Supp. 1979). *See* notes 44-45 *supra*.

104. Burger v. County of Mendocino, 45 Cal. App. 3d 322, 119 Cal. Rptr. 568 (1975).

105. *Id.*

> that the alternative principally recommended by the EIR and the planning department was not feasible economically, and one witness assumed the same, although disclaiming any experience or expertise in that field. There is no estimate of income or expenditures, and thus no evidence that reduction of the motel from 80 to 64 units, or relocation of some units, would make the project unprofitable.[106]

In light of the *Burger* decision, a finding that solar heating is infeasible will be supported only by evidence that incorporation will render the project *unprofitable*. In most cases, this will be unlikely because developers can pass the cost of the system on to the consumer, who can in turn amortize the cost of the system. Therefore, in normal circumstances, it will be a prejudicial abuse of discretion if a project is approved without incorporating solar heating as a feasible mitigation measure, without including detailed findings explaining either why solar is not a feasible mitigation measure or what specific factors have rendered solar heating infeasible.

There will clearly be situations in which the incorporation of solar heating will be economically infeasible. However, as shown above, claims of economic infeasibility should be closely scrutinized. Because environmental protection is the guiding criterion in public decisions, economic considerations, although important, do not control.[107]

The solar heating industry is relatively new, and as a result many problems exist. Unavailability of solar systems and additional building capital requirements, as well as other problems relating to quality control, warranties, and installation expertise, all may be factors that militate against the inclusion of solar heating in a residential development.[108] These factors, compounded with

106. *Id.* at 326-27, 119 Cal. Rptr. at 570.

107. San Francisco Ecology Center v. City of San Francisco, 48 Cal. App. 3d 584, 590, 122 Cal. Rptr. 100, 104 (1975) (challenge to the adequacy of an EIR concerning the expansion of San Francisco International Airport); Environmental Defense Fund, Inc. v. Coastside County Water Dist., 27 Cal. App. 3d 695, 704, 104 Cal. Rptr. 197, 202 (1972) (CEQA applies to private as well as public projects).

108. Legislation has been proposed to adopt a state-insured warranty program, aid developers with enhanced capital requirements for solar developers, set up a state-sponsored loan corporation for solar businesses, provide job training for solar jobbers, and provide many other incentives to aid solar implementation. *See* Solar Cal Council, Toward a Solar California: The Solar Cal Action Program (December 11, 1978) (available from Solar Business Office, State of California). A number of solar incentives have already been adopted by the California legislature. A.B. 2225, ch. 413, 1978 Cal. Stats., allows banks and lending institutions to make more generous solar loans; A.B. 2851, ch. 1243, 1978 Cal. Stats., increases Cal-Vet home loans by $5,000 if the home is equipped with solar heating; A.B. 3247, ch. 1100, 1978 Cal. Stats., requires the Public Utilities Commission to investigate the feasibility of long-term low-interest loans to consumers by private utilities; A.B. 3623, ch. 1159, 1978 Cal. Stats., revised the existing 55% incentive to purchasers of solar devices (25% for condominiums and apartments); A.B. 2841, ch. 1091, 1978 Cal. Stats., requires study and planning of solar job-training programs; A.B. 3046,

high installation costs, may constitute evidence supporting a finding of infeasibility. However, if the initial cost of solar heating becomes less expensive or stays the same and the costs incident to conventional heating systems continue to rise, as seems probable, determinations of economic infeasibility will become increasingly difficult to justify.[109]

Under normal circumstances, therefore, solar heating qualifies as a feasible mitigation measure that will substantially lessen the significant environmental effects of a proposed residential development.[110] It follows, then, that unless specific individual considerations make solar heating infeasible for a given project, it should be incorporated into the project as a condition of approval. *Friends of Mammoth v. Board of Supervisors*[111] supported this view: "Obviously if the adverse consequences to the environment can be mitigated, or if feasible alternatives are available, the proposed activity, such as the issuance of a permit, should be approved."[112]

Enforcing Proper Consideration of Solar Heating

If a residential development or similar project is approved without adequate discussion of solar heating in the EIR, interested members of the public can ensure that all procedures of CEQA have been carefully complied with and the discretion of local or state administrators has been properly exercised. If the agency has failed to include solar heating to mitigate wasteful use of energy, and has nonetheless granted the necessary permits, judicial review of the agency determination may be sought. A petition for a writ of mandate may be brought to compel the agency involved either to perform any procedures that were improperly omitted or to reconsider its decision in light of the evidence in the record

ch. 1367, 1978 Cal. Stats., provides for a state-wide design competition for residential applications using passive solar systems.

109. Economics of scale, tax incentives, further research and development, more advanced and efficient design, and greater installation expertise will all work to decrease the cost of solar heating.

110. Similar arguments may be made for office buildings, shopping centers, and other projects in which solar heating, especially for water, will be feasible because of economics of scale.

111. Friends of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 502 P.2d 1049, 104 Cal. Rptr. 761 (1972).

112. *Id.* at 263, 502 P.2d at 1059, 104 Cal. Rptr. at 771. Indeed, the court emphasized its point: "In making these determinations concrete concepts, not mere aphorisms or generalities, must be considered." *Id.*

that contradicts the agency's decision.[113] The California courts have broadly construed the standing requirements in order to effectuate the express goal of CEQA, which is to afford the greatest environmental protection within the statutory framework.[114] An individual (or organization) need only allege that (s)he will be harmed by the environmental effects of the challenged project[115] or that (s)he seeks enforcement of a public duty.[116] The plaintiff need only allege either that the failure to include solar heating in a proposed development will increase demand on local utilities ultimately resulting in environmental degradation or that as an interested member of the public, (s)he seeks to ensure that administrators have faithfully fulfilled the statutory obligations of CEQA. Either will be sufficient to fulfill the threshold requirement of standing.[117]

Mandamus

Failure to include or consider solar heating will constitute grounds to set aside agency approval of a project if the court determines there has been a prejudicial abuse of discretion.[118] Such

113. CAL. PUB. RES. CODE §§ 21168, 21168.5 (West 1977); CAL. CIV. PROC. CODE § 1094.5 (West Supp. 1979).

114. Friends of Mammoth v. Board of Supervisors, 8 Cal. 3d 247, 502 P.2d 1049, 104 Cal. Rptr. 761 (1972).

115. Bozung v. Local Agency Formation Comm'n, 13 Cal. 3d 263, 529 P.2d 1017, 118 Cal. Rptr. 249 (1975) (citing United States v. SCRAP, 412 U.S. 669, 683-85 (1973)). The court in *Bozung* emphasized its broad holding regarding environmental standing by refusing to limit plaintiffs to those who reside in the same city as the proposed project. "Effects of environmental abuse are not contained by political lines; strict rules of standing that might be appropriate in other contexts have no application where broad and long-term effects are involved." *Id.* at 272, 529 P.2d at 1023, 118 Cal. Rptr. at 255.

116. *Id.*; Kappadahl v. Alcan Pacific Co., 222 Cal. App. 2d 626, 643, 35 Cal. Rptr. 354, 365 (1963).

117. Bozung v. Local Agency Formation Comm'n, 13 Cal. 3d 263, 529 P.2d 1017, 118 Cal. Rptr. 249 (1975). *See also* City of Davis v. Coleman, 521 F.2d 661 (9th Cir. 1975) (interpreting *Bozung* to give standing to those with some geographical nexus to the site of the project); No Oil, Inc. v. Occidental Petroleum Corp., 50 Cal. App. 3d 8, 123 Cal. Rptr. 589 (1975); People *ex rel* Dep't of Pub. Works v. Bosio, 47 Cal. App. 3d 495, 121 Cal. Rptr. 375 (1975).

118. CAL. PUB. RES. CODE §§ 21168, 21168.5 (West 1977). Section 21168 applies to determinations for which a hearing has been required by law; it prohibits the reviewing court from exercising its independent judgment, but states that the court "shall only determine whether the act or decision is supported by substantial evidence in light of the whole record." CAL. PUB. RES. CODE § 21168 (West 1977).

Section 21168.5, which applies to all other administrative determinations (which will be the bulk of CEQA decisions), states:

> In any action or proceeding, other than an action or proceeding under Section 21168, to attack, review, set aside, void or annul a determination, finding, or decision of a public agency on the grounds of noncompliance with this division the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the agency

an abuse of discretion may be shown if the agency has not proceeded in a manner prescribed by law or if the determination is not supported by substantial evidence.[119] Agencies should fulfill the mandate of CEQA without awaiting judicial compulsion,[120] but courts will exercise their authority where appropriate.[121]

Procedural Review

CEQA contains detailed procedural requirements relating to mitigation measures. As indicated above, all potential mitigation measures should be set out in the draft EIR. In addition, those measures that are brought to the agency's attention in the comment phase must be included in the final EIR. Each measure must be individually discussed, and if it is not incorporated into the project a statement of overriding factors must be given.[122] None of these procedural aspects involves any discretion on the part of the administrator. Therefore, a reviewing court will set aside agency approval of a project if the agency has failed to follow the procedures outlined above.[123]

Thus an EIR is defective if it fails to include a detailed statement setting forth mitigation measures proposed to reduce the wasteful, inefficient, and unnecessary consumption of energy. In *People v. County of Kern*,[124] the California Attorney General sought to enjoin the issuance of any building permits or other entitlements of use for the Rancho El Contento housing subdivision. Further, the petitioners sought a writ of mandate requiring the county board of supervisors to comply with the requirements of CEQA. The court of appeal granted the requested relief. "[R]esolution 76-119 is fatally defective as a final EIR because of its failure to include a detailed statement setting forth the mitigation measures proposed to reduce wasteful, inefficient, and un-

has not proceeded in a manner required by law or if the determination or decision is not supported by substantial evidence.

CAL. PUB. RES. CODE § 21168.5 (West 1977). *See* Universal Camera Corp. v. NLRB, 340 U.S. 474 (1951).

119. CAL. PUB. RES. CODE § 21168.5 (West 1977); City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 139 Cal. Rptr. 214 (1977); People v. Department of Hous. & Community Dev., 45 Cal. App. 3d 185, 119 Cal. Rptr. 266 (1975).

120. County of Inyo v. City of Los Angeles, 71 Cal. App. 3d 185, 205, 139 Cal. Rptr. 396, 409 (1977).

121. *See* Hildreth, note 10 *supra*.

122. *See* text accompanying note 83 *supra*.

123. *Id.*

124. 62 Cal. App. 3d 761, 133 Cal. Rptr. 389 (1976).

necessary consumption of energy as required by [CEQA]."[125] The same reasoning should also extend to whether proposed measures that have been or *should have been* included in the EIR have been thoroughly discussed because it is the primary responsibility of the lead agency to promulgate a complete EIR.[126] Particularly, failure to respond with specific detail to comments that are at variance with the administrative determination is cause for judicial reversal of agency approval of a project.[127]

Substantive Review

Although CEQA expresses a strong substantive policy in favor of environmental protection, very little guidance is given to reviewing courts on how to enforce this policy.[128] Because CEQA applies only to *discretionary* agency decisions,[129] courts are reluctant to substitute their judgment for that of administrators.[130] CEQA provides for judicial review to determine whether the agency's decision is based on substantial evidence in the record.[131] The EIR constitutes evidence that the court will review.[132]

125. *Id.* at 774, 133 Cal. Rptr. at 397 (citing CAL. PUB. RES. CODE § 21100(c) (West 1977)). *See also* CAL. ADMIN. CODE tit. 14, § 15143(c) (1978). The court also ruled that failure to respond to comments concerning potential ground water pollution, potential ground water supply, and inadequacy of existing electrical facilities was an abuse of discretion. People v. County of Kern, 62 Cal. App. 3d 761, 771, 133 Cal. Rptr. 389, 395-96 (1976).

126. *See* CAL. ADMIN. CODE tit. 14, § 15064 (1978); Hildreth, *supra* note 10, at 813.

127. City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 94, 139 Cal. Rptr. 214, 220 (1977); CAL. ADMIN. CODE tit. 14, § 15146(b) (1978). *See* note 13 *supra*. *But see* Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519 (1978) (placing burden upon environmental review participants to inform the responsible agency and meet a threshold requirement of materiality before the agency's obligation is triggered under the National Environmental Policy Act of 1969, 42 U.S.C. § 4321 (1976)).

128. CAL. PUB. RES. CODE § 21081 (West 1977) provides:

> Pursuant to the policy stated in Sections 21002 and 21002.1, *no public agency shall approve or carry out a project* for which an environmental impact report has been completed which identifies one or more significant effects thereof unless such public agency makes one, or more, of the following findings:
>
> (a) Changes or alterations have been required in, or incorporated into, such project which mitigate or avoid the significant environmental effects thereof as identified in the completed environmental impact report.
>
> (b) Such changes or alterations are within the responsibility and jurisdiction of another public agency and such changes have been adopted by such other agency, or can and should be adopted by such other agency.
>
> (c) Specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the environmental impact report.

(Emphasis added). *See also* Hildreth, *supra* note 10, at 806.

129. CAL. PUB. RES. CODE § 21080 (West Supp. 1979).

130. San Francisco Ecology Center v. City of San Francisco, 48 Cal. App. 3d 584, 591, 122 Cal. Rptr. 100, 104 (1975).

131. CAL. PUB. RES. CODE § 21168.5 (West 1977).

132. City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 94, 139 Cal. Rptr. 214, 220 (1977).

The lack of specific findings will render the decision unsupported by substantial evidence.[133]

The evidence in the record determines whether a reviewing court will uphold an agency determination. The substantial evidence test requires that the decision be supported by reasonable, credible, and solid proof of the essentials which the law requires in a particular case.[134] The court will consider the entire record, including opposing evidence.[135] If the feasibility of solar heating was clearly presented to the agency during the administrative phase, with appropriately detailed supporting studies, this "comment" has now become part of the record. Failure by the agency to respond in similar detail explaining its infeasibility should render its decision unsupported by substantial evidence. If the record is unclear regarding solar feasibility, the courts will not attempt to second guess the administrator. "[T]he reviewing court must resolve *reasonable* doubts in favor of the administrative findings and decision."[136] The importance of creating a thorough record at the administrative level thus becomes clear. Judicial reluctance to encroach upon the discretion of administrators makes enforcement of the substantive mandate of CEQA difficult. A simple economic decision, unsupported by reasoned findings, will not support an agency determination.[137] On the other hand, a rea-

133. *Id.* at 91, 139 Cal. Rptr. at 218.

134. Bank of America v. State Water Resources Control Bd., 42 Cal. App. 3d 198, 213, 116 Cal. Rptr. 770, 780 (1974).

135. The court may not isolate the supporting evidence and ignore the rest; it must review the entire record. Bixby v. Pierno, 4 Cal. 3d 130, 481 P.2d 242, 93 Cal. Rptr. 234 (1971); LeVesque v. Workmen's Comp. Appeals Bd., 1 Cal. 3d 627, 463 P.2d 432, 83 Cal. Rptr. 208 (1970). *Accord*, Universal Camera Corp. v. NLRB, 340 U.S. 474, 488 (1951), where the court stated:

> To be sure, the requirement for canvassing "the whole record" in order to ascertain substantiality does not furnish a calculus of value by which a reviewing court can assess the evidence. Nor was it intended to negative the function of the Labor Board.... Nor does it mean that even as to matters not requiring expertise a court may displace the Board's choice between two fairly conflicting views, even though the court would justifiably have made a different choice had the matter been before it *de novo*. Congress has merely made it clear that a reviewing court is not barred from setting aside a board decision when it cannot conscientiously find that the evidence supporting that decision is substantial, when viewed in the light that the record in its entirety furnishes, including the body of evidence opposed to the Board's view.

136. City of Carmel-By-The-Sea v. Board of Supervisors, 71 Cal. App. 3d 84, 91, 139 Cal. Rptr. 214, 218 (1977) (emphasis added).

137. Burger v. County of Medocino, 45 Cal. App. 3d 322, 119 Cal. Rptr. 568 (1975).

soned economic decision, supported by evidence in the record, will be upheld by the courts. In light of forecasted power shortages, increasing prices of conventional energy sources, amortized solar costs, and increasingly difficult pollution problems facing Californians today, it is difficult to determine what reasoned economic arguments can constitute substantial evidence to support an agency's failure to require solar heating.

CONCLUSION

Environmental protection and enhancement were made important goals for all Californians with the adoption of CEQA. The EIR is the "backbone" of CEQA. It is the vehicle through which important environmental considerations are brought to the attention of administrators who are responsible for approving projects with potentially harmful environmental consequences. The EIR must list the probable adverse environmental effects, as well as ways to avoid or mitigate them.

Whenever a residential development is proposed, it will constitute a new burden upon already taxed energy sources. This in turn will increase resulting pollution from conventional sources. In order to mitigate this energy demand, the lead agency should explore solar heating.

Solar energy is a technology that is ready for Californians to utilize today. It is an environmentally benign energy source which can substantially reduce demand upon conventional sources that cause environmental harm. It can stem, if not actually reduce, pollution resulting from increasing energy production and consumption. Solar heating is therefore a feasible mitigation measure that can reduce the adverse environmental effects of proposed residential development.

It follows that unless specific factors of an individual project render incorporation of solar heating "infeasible," it should be required as a condition of project approval. If the agency fails to consider solar in the draft EIR, this alternative may be brought to the agency's attention during the comment phase. A thorough presentation of solar's feasibility to the agency is essential. Failure to require solar heating as a condition of project approval will constitute a prejudicial abuse of the agency's discretion absent a properly evidenced statement of overriding considerations. In this way a relatively new environmentally beneficial technology

can help achieve the goals of CEQA: "to develop and maintain a high quality environment now and in the future."

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